

On using plug in the absence of ECal for better muon identification for the first stage of SPD

Rymbekova Aierke

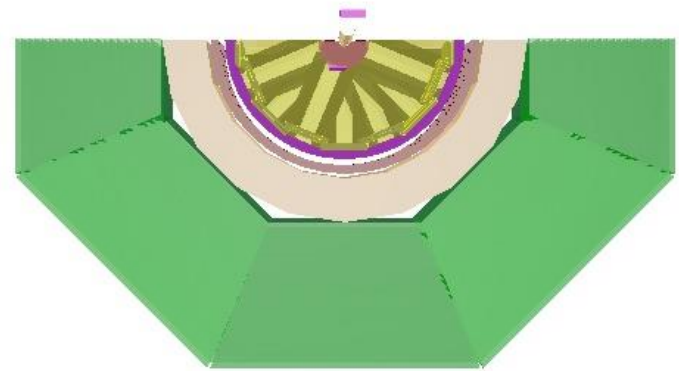
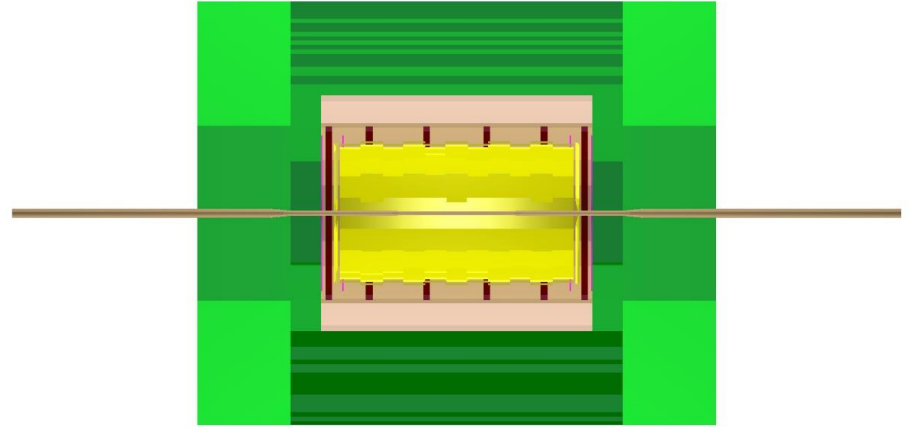
JINR, Dubna

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Plug information

Material	Concrete
Weight	30359.8 kg
Thickness	42 cm
Radius	175.4 cm
HalfLength	201.6 cm

Weight is equal to 2/3 of Ecal's barrel weight



General information

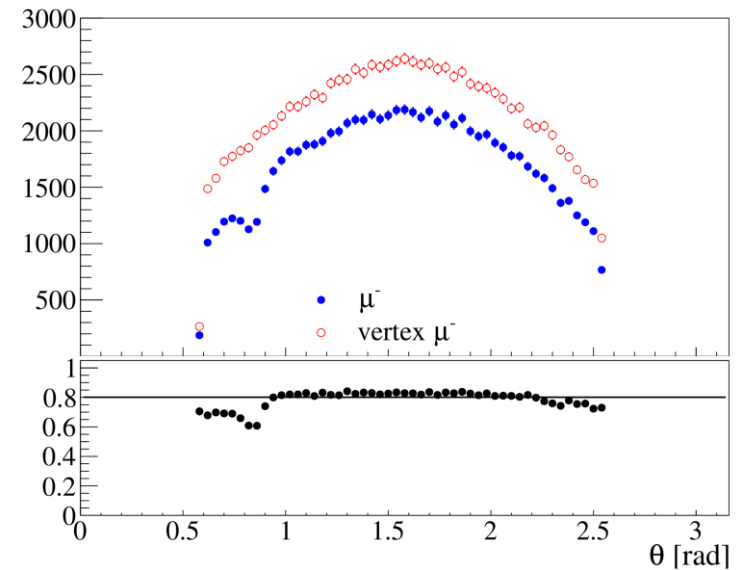
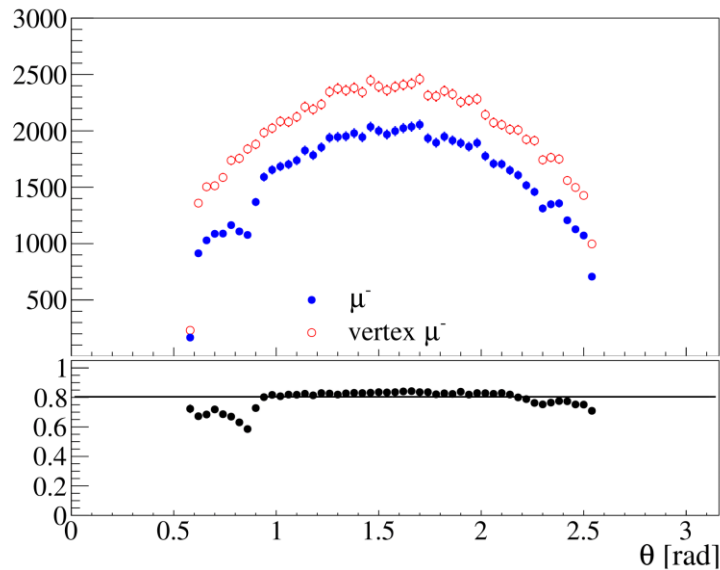
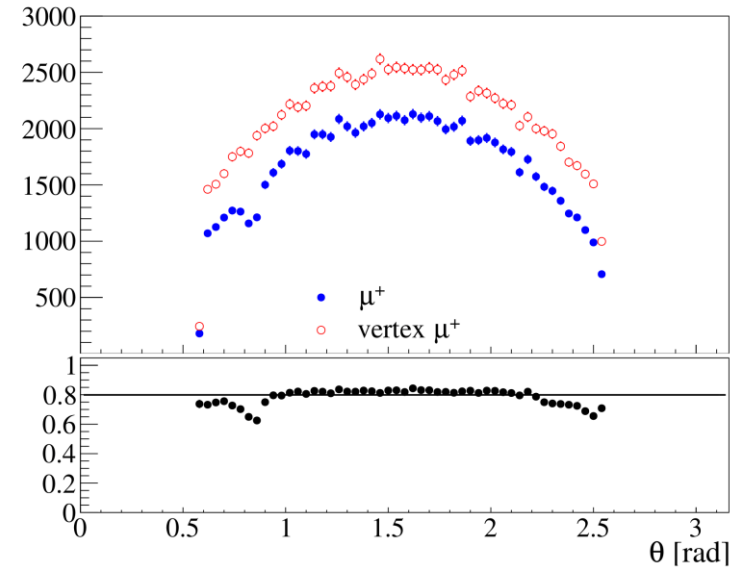
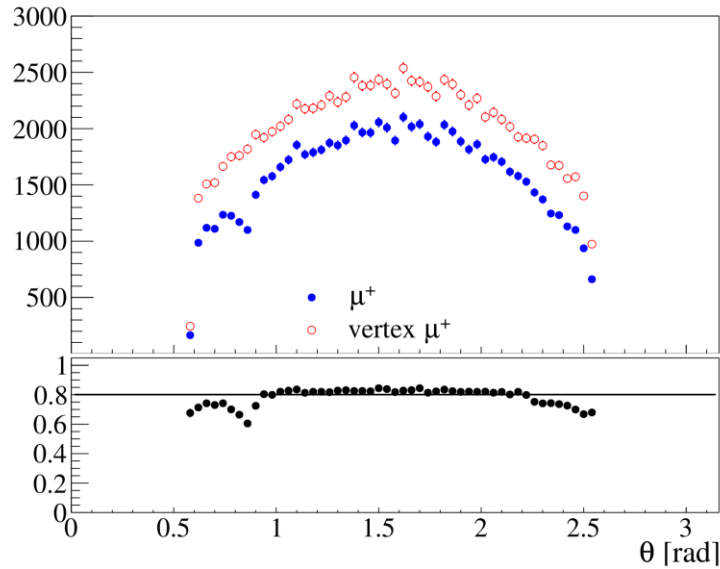
- Isotropic generator was used
- Muons and pions with energy equal to 1.5 GeV
- One particle in the event
- Theta angle [34, 146] degrees
- Phi angle [0, 360] degrees

Muons

Track length > 50

Before concrete plug

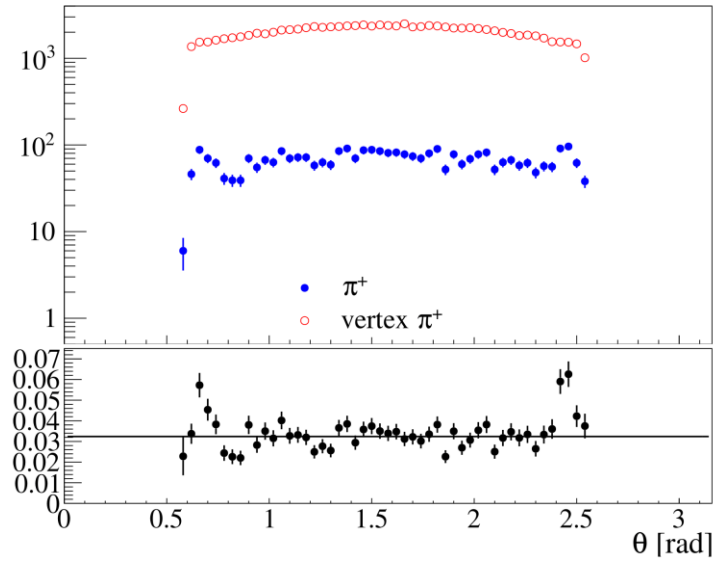
With concrete plug



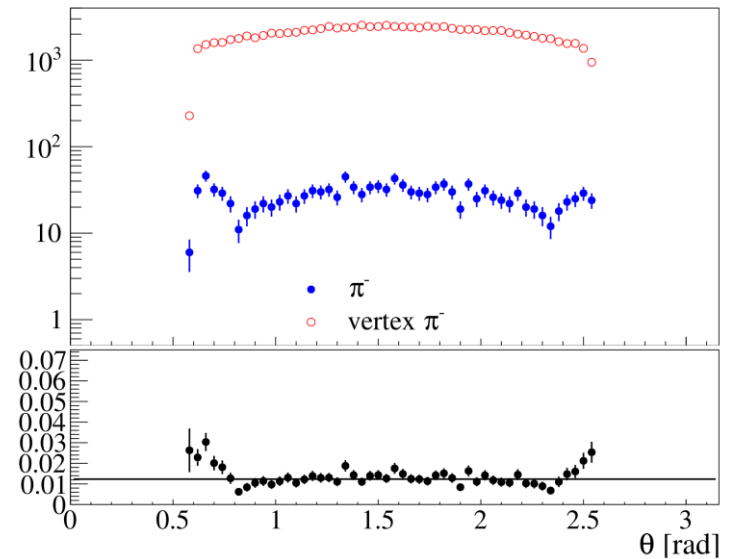
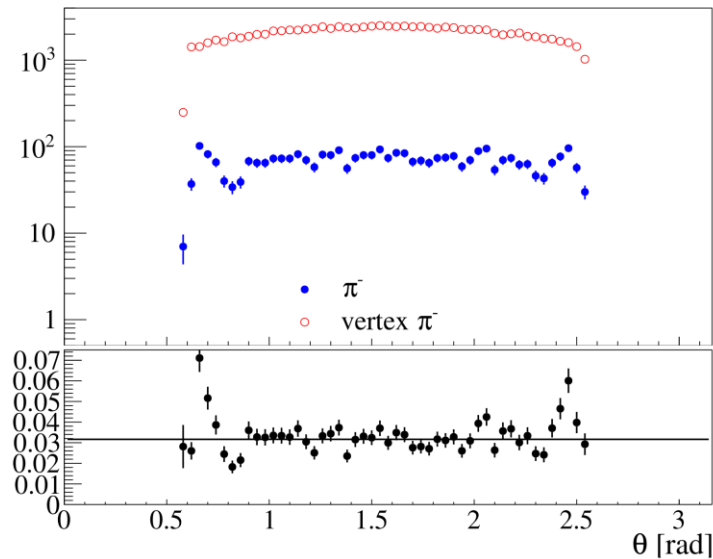
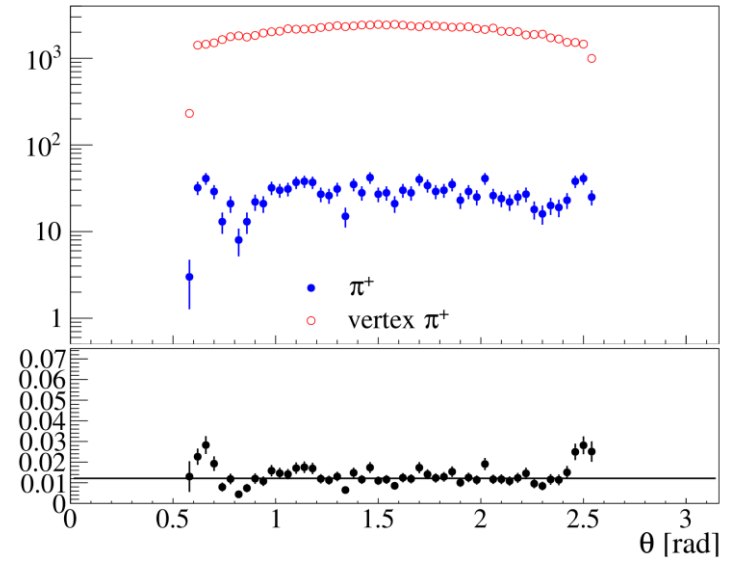
Pions

Track length > 50

Before concrete plug

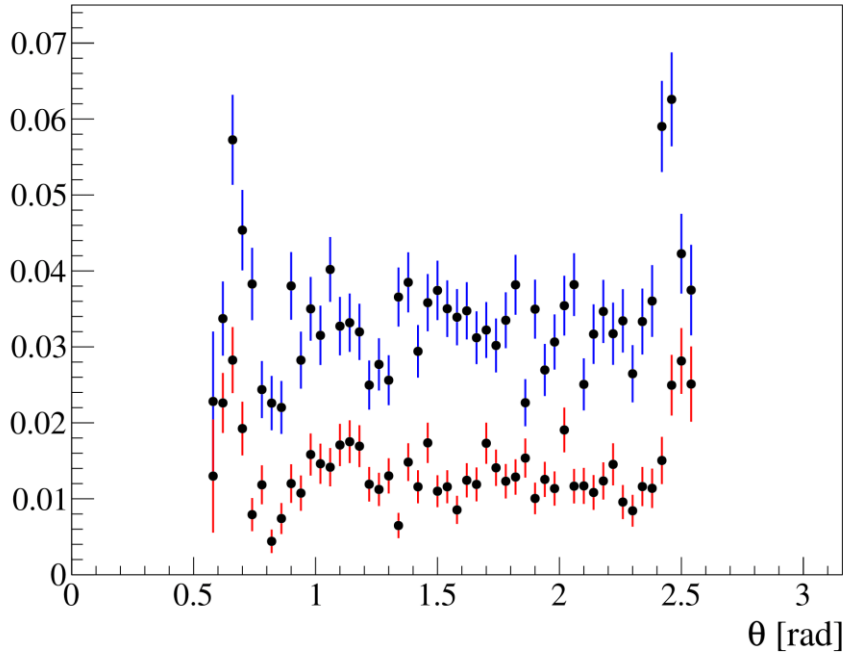


With concrete plug

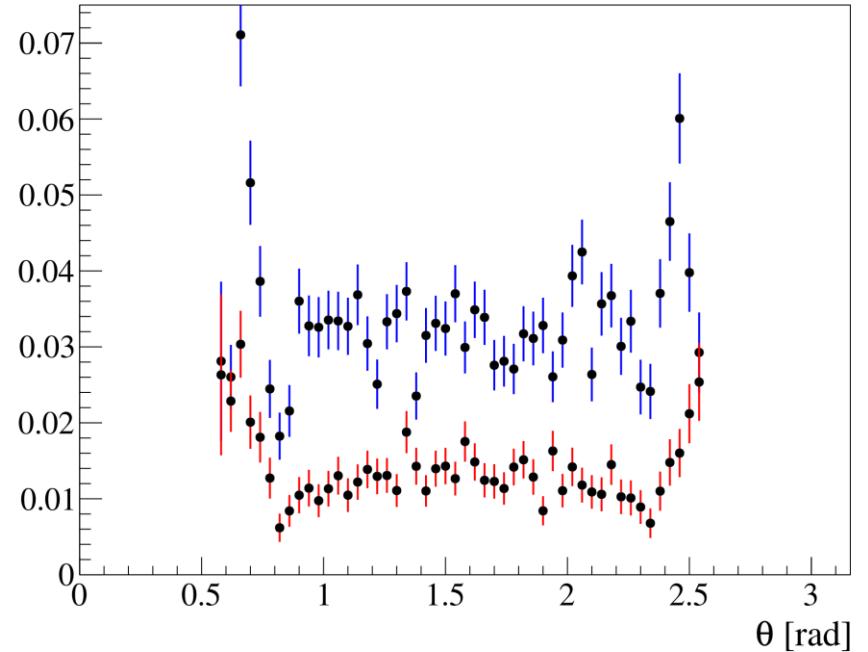


Pions comparison

Positive pion



Negative pion



	Without plug	With plug
Positive pion	3.24 ± 0.05 %	1.21 ± 0.03 %
Negative pion	3.16 ± 0.05 %	1.23 ± 0.03 %

Efficiencies

	Without plug	With plug
Positive muon	$80.1 \pm 0.12 \%$	$79.9 \pm 0.12 \%$
Negative muon	$80.4 \pm 0.12 \%$	$80.1 \pm 0.12 \%$

	Without plug	With plug
Positive pion	$3.24 \pm 0.05 \%$	$1.21 \pm 0.03 \%$
Negative pion	$3.16 \pm 0.05 \%$	$1.23 \pm 0.03 \%$